SCIENCE TEST
Top tips

This revision guide will help you prepare for the Key Stage 3 science tests.

Things to remember when tackling science questions

- Read all of the question carefully or you may miss important information.
- Make sure you understand what the question is asking. Even if a picture or diagram is familiar the question might not be the one you expect.
- You can draw or write on the question paper if this helps. For example, when trying to read a graph it's OK to draw lines from the axis to the point you are trying to read.
- Don't be put off if you find a question on something you may not have covered in your science lessons. These sorts of questions are not testing what you can remember but whether you can read and make sense of some new information on a science topic you have studied.
- You should always try to use scientific words and conventions accurately. It may not be crucial to spell all the words entirely correctly but you should know when to use them. For example, think about words such as 'temperature' and 'heat'. Temperature is a measure of how hot something is; heat is a form of energy.
- Don't forget to include units such as °C, s (seconds), g, N etc. where they are needed. In science numbers without units have no meaning.
- Arrows in food webs or light rays must point in the correct direction. Use a ruler to draw light rays.

Tackling questions about practical work and results

Some questions test how well you can do practical work. Others test your understanding of results and what they might mean. To answer these questions you need to be able to:

1 recognise equipment described in words or from a diagram and explain how to use it correctly and safely;

2 identify important features of an investigation;

3 read results tables, bar charts and line graphs accurately; identify trends or patterns;

4 interpret evidence (in words or numbers) from investigations and draw valid conclusions from it;

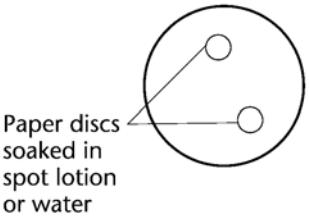
5 suggest reasons or explanations;

6 predict consequences of an action or event (sometimes given some information).

The examples below show how you might tackle these sorts of questions.

1 Recognising and using scientific equipment safely and correctly

Spots may be caused by bacteria in the skin. A researcher investigated the effects of spot lotion on bacteria by growing bacteria on the surface of jelly on a Petri dish. He placed small discs of paper on the surface of the jelly. One disc had been soaked in spot lotion and the other in water.



Give **two** safety precautions the researcher should take to avoid contact with the bacteria.

To answer this question you need to know what a Petri dish is, and what bacteria are and why the researcher needs to avoid contact with them.

You could choose two correct answers from the following:

- keep the Petri dish lid on as much as possible;
- once the discs are on the jelly, tape the lid down to stop it being knocked off;
- use tweezers, not fingers, to put the discs on the jelly;
- wear eye protection and possibly gloves.

2 Identifying important features of an investigation

Sarah added some salt to 100 cm^3 of cold water in a beaker. She stirred the water to dissolve the salt. She added more salt until no more would dissolve.

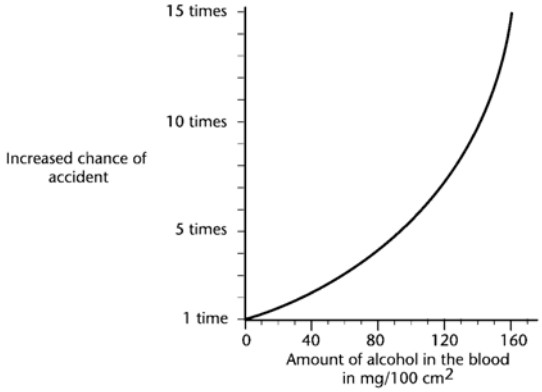
She repeated this experiment with sugar, baking powder and instant coffee powder. Each time she used a different beaker containing 100 cm^3 of cold water.

Describe **two** ways in which Sarah made this experiment a fair test.

In a fair test you need to keep everything the same except the factor being investigated. Sarah is changing the substance she is dissolving. The things she needs to keep the same are the amount (volume) of water, the temperature of water, and the amount of stirring.

3 Reading results and identifying trends or patterns

Using the graph, describe how increasing the amount of alcohol in the blood affects the chance of having an accident.



You need to understand the graph by looking at the labels on the axes and then

the shape of the line. Increasing the amount of alcohol in the blood increases the chance of an accident. However, the graph is not a straight line but a curve which gets steeper. So the chances of having an accident increase more quickly as the amount of alcohol goes up.

4 Interpreting evidence and drawing conclusions

Type of road surface	Stopping distance (metres)			
	New tyres on dry road	New tyres on wet road	Old, worn tyres on dry road	Old, worn tyres on wet road
Smooth tarmac	18	19	20	50
Rough tarmac	13	18	17	23
Concrete	12	17	16	21

A question about car tyres and stopping distances included the above table of results.

(a) What happens to the stopping distance when a road gets wet?

(b) Why does the stopping distance change when the road gets wet?

(c) What happens to the stopping distances as tyres get old and worn?

(d) What is the safest type of road surface in the table?

You must read the numbers carefully, paying close attention to the labels for the rows and columns.

(a) Compare wet and dry roads. In every case the stopping distance on a wet road is more than on a dry one.

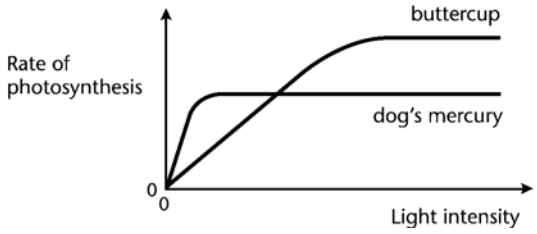
(b) To answer this question you need to remember work on friction.

(c) When comparing old and new tyres, in every case old tyres take longer to stop than new ones.

(d) The surface with the shortest stopping distances will be the safest – this is concrete.

5 Suggesting reasons or explanations

Buttercup plants grow mainly in open fields. Dog's mercury is a plant which grows mainly in woodland. The graph shows how the rate of photosynthesis in these two plants changes as light intensity changes.



Why do dog's mercury plants grow better than buttercups in woodland? Use the graph to help you.

You need to remember that woodland is likely to be quite shady.

The graph for dog's mercury goes up more quickly than that for the buttercup, showing that dog's mercury starts to photosynthesise faster in low light.

The line then levels off, showing that dog's mercury quickly reaches a level when

increasing the amount of light makes no difference to the rate of photosynthesis.

Although the line for buttercup is less steep, it gets higher than that for dog's mercury which means that if there is enough light buttercups will photosynthesise more.

6 Predicting consequences

Substance	Melting point (°C)	Density (mass of 1 cm^3, in g)
Water	0	1.0
Paraffin wax	60	0.8
Naphthalene	80	1.2

The table gives some of the properties of three substances: water, paraffin wax and naphthalene.

(a) Draw the shape and position of a small ball of naphthalene which has been placed in a beaker of water at 70 °C for ten minutes.

(b) Draw the shape and position of a ball of paraffin wax which was also placed in a beaker of water at 70 °C for ten minutes.

The table gives you melting points and densities. You need to remember what these mean because this will allow you to work out the correct answers.

At 70 °C naphthalene will not melt so it will still be a ball. It also has a greater density than water so it will sink. Therefore the picture will be a ball at the bottom of the beaker.

At 70 °C paraffin wax will melt and so spread into a layer. Because the density of paraffin wax is less than water the layer will float on the top of the water.

Tackling questions that test your understanding

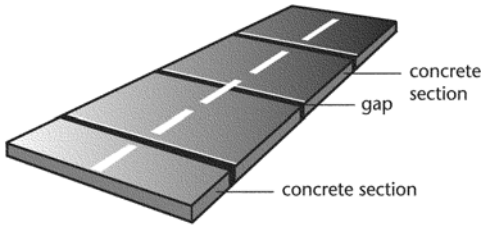
Science is not just about remembering what you did in lessons. It's about understanding some of the important ideas and seeing how they apply in different situations.

Some questions will test this kind of understanding. To answer these you should be able to:

- link ideas, make deductions or draw inferences, sometimes drawing on different sorts of information.

Here's an example. Notes about how you could answer it are below.

Some roads are made of concrete which is laid in sections with small gaps between them.



(a) What happens to the size of most objects when they get hotter?

(b) When the temperature rises, what will happen to the gaps between the concrete sections?

(c) When the temperature rises, what might happen to the sections of concrete if there are no gaps between them?

(d) The gaps between the concrete sections are filled with tar. The tar becomes soft when it is warm. Why is it important that the tar becomes soft?

You may not have studied concrete roads but this does not matter. The question is about expansion.

You will probably remember that most objects expand as they get hotter. You can work out that as the concrete sections get bigger, the gaps between them will get smaller.

If there were no gaps, there would be no room for the concrete sections to expand which might cause them to bend or crack.

Because warm tar becomes soft, it can flow out of the gaps and back in again as the concrete sections expand and contract.